

Application Serial No. 10/501,842
Amendment dated June 20, 2007
Reply to Office Action dated December 20, 2006

Amendments to the Drawings

The attached sheet of drawings includes a change to Fig. 5. This sheet, which includes Fig. 5, replaces the original sheet. In Fig. 5, previously omitted element 6' has been added.

Enc. Replacement Sheet
Annotated Sheet Showing Change Made

REMARKS/ARGUMENTS

Regarding the rejection of Claim 7 under 35 U.S.C. §112, this claim has been revised such that it claims only the broader range. New Claim 21 now claims the narrower range.

The rejection of Claims 1-5, 8-13 and 18-19 as being anticipated by Ito is respectfully traversed. It is requested that the Examiner reconsider and withdraw this rejection for the reasons set forth below.

Independent Claim 1 calls for "means to increase emission frequency component beat intensity" and this means is specifically disclosed as an injection light source, preferably an injection laser. An object of the present invention is to provide a radiation source that will result in lower noise at the detector. This is effected by increasing the intensity of the beat signal by altering the emission of different frequency components (laser modes). As explained in paragraph 14 of the present application, the prevailing assumption is that the beat portions coming from different individual modes of the frequency shifted lasers would interfere additively. Surprisingly, they interfere destructively. Accordingly, the invention provides a means for increasing the intensity of the beat signal of the frequency components of the emitted radiation by providing an injection light source, for example, a seed laser which injects laser light from a different laser source into the resonator and thereby provides a large number of photons at a given injection laser frequency. These photons dominate in number over photons emitted spontaneously, in particular as they start to depopulate the gain medium thus reducing spontaneous emission further.

It is important to recognize that a seed laser/injection laser is different from a laser that only pumps the gain medium. A pump laser such as disclosed by Ito is nothing more than a source of energy for the gain medium. An injection laser, on the other hand, is not intended to supply all the energy needed for the gain medium so as to bring the gain above unity. No such injection laser or other means for increasing the emission frequency component beat intensity is disclosed by Ito. Ito describes a configuration of an FSF laser in column 4, lines 44+, which includes two laser diodes that provide energy to the gain medium through a wave division multiplexing coupler 23. At column 6, line 55, it is specifically disclosed that the lasers serve as the excitation light sources. In other words, the 1.48 μm LD-laser diodes provide only the energy of the gain medium. They do not serve as the seed/injection laser and therefore not the claimed means to increase emission frequency component beat intensity.

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A simple power supply for a gain medium cannot be construed as a means for reducing noise by increasing the emission frequency component beat intensity. Since this is all that Ito discloses, Ito neither anticipates nor renders obvious the subject matter defined by the claims. Accordingly, Claims 1-13 and 18-20 are neither anticipated nor rendered obvious by Ito.

For the same reasons, Claims 14-17 are not obvious over Ito combined with either Nigham or Phillips.

The provisional rejection of Claims 1-15 and 20 on the basis of obvious-type double patenting is noted. However, there is a clear difference between a radiation source and apparatus for detecting the distance of an object.

In the event Applicants have overlooked the need for an extension of time, payment of fee, or additional payment of fee, Applicants hereby petition therefor and authorize that any charges be made to Deposit Account No. 02-0385, Baker & Daniels.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: June 20, 2007

JOHN F. HOFFMAN, REG. NO. 26,280

Name of Registered Representative

Signature

June 20, 2007
Date

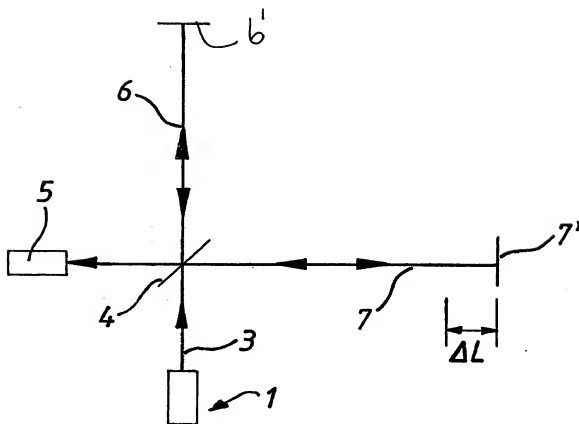


FIG. 5